Fall 2020

CS 116-101: Introduction to Computer Science II in C++

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Ying Wu College of Computing
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CS 116 Introduction to Computer Science II in C++
Course Syllabus, Fall 2020
Instructor: Dr. Jun Wu
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Class Time Friday 6:00 – 8:40 PM Online
Office Hours Monday 5:00 – 5:50 PM Online

I. COURSE DESCRIPTION:

A study of advanced programming topics with logical structures of data, their physical representation, design and analysis of computer algorithms operating on the structures, and techniques for program development and debugging. Course covers program specifications, correctness and efficiency, data abstraction, basic aspects of simple data structures, internal searching and sorting, recursion and string processing. Algorithmic analysis is also discussed.

Prerequisite: CS 115

II. INSTRUCTIONAL MATERIALS:

Required Textbook: Data Structures & Other Objects Using C++, 4th edition.
ISBN: 0-13-212948-5, 978-0-13-212948-0. Authors: Michael Main, Walter Savitch

Optional Web Based Textbook Zybooks.com: Data Structures Essentials
Instruction to subscribe:
1. Sign in or create an account at learn.zybooks.com
2. Enter code: **NJITCS116WuFall2020**

III. METHODS OF INSTRUCTION

Lectures, labs, projects, exams are used.

IV. METHODS OF EVALUATING STUDENT ACHIEVEMENT/ PROGRESS:

There will be **six programming projects** distributed roughly every two weeks in the first twelve weeks (counted 60% of your final grade). There will be **one final exams** (40% of your final grade).

V. CLASS SCHEDULE

Topics	Planned Lecture Topics	Read/Project
Topic 1	Introduction & Software Development	Ch.1
Topic 2	ADT & C++Classes	Ch.2.1-2.3, Project 1
Topic 3	More Classes and Operator Overloading	Ch.2.4-2.6
Lab 1	Project 1 Help Session	
Topic 4	Container Classes.	Ch. 3
Topic 5	Container Classes(cont.)	Ch.3, Project 2
Topic 6	Pointers and Dynamic Arrays(I)	Ch. 4.1-4.2
Lab 2	Help Session	
Topic 7	Pointers and Dynamic Arrays (II)	Ch. 4.2-4.5
Topic 8	Dynamic Classes and the Big Three	Project 3
Topic 9	Linked Lists	Ch. 5.1-5.2 Project 4
Lab 3	Project 3 Help Session	
Topic 10	Building & Using the Linked List Toolkit	Ch. 5.3-5.6
Topic 11	Software Development Using Templates and Iterators	Ch.6
Topic 12	Stacks and Queues	Ch. 7, Ch. 8
Lab 4	Project 4 Help Session	
Topic 13	Introduction to Recursion	Ch. 9.1 Project 5
Topic 14	Using and Reasoning about Recursion	Ch. 9.2-9.3
Topic 15	Trees and Traversals	Ch. 10.1- Ch. 10.4
Lab 5	Project 5 Help Session	
Topic 16	Binary Search Trees and the Bag Class with a BST	Ch. 10.5, Project 6
Topic 17	Heaps and Priority Queues	Ch. 11.1, 11.2
Topic 18	B-Trees and Set Class	Ch. 11.3
Lab 6	Project 6 Help Session	
Topic 19	Searching	Ch.12.1-12.2
Topic 20	Hashing	Ch 12.2-12.4
Topic 21	Quadratic Sorting	Ch 13.1
Topic 22	Recursive Sorting, Heap sort	Ch. 13.2- Ch 13.4
Final	Final Exam	

VI. Academic Integrity Policy

All course work, including exams, assignments, labs, projects must be done by student themselves. Sharing materials with classmate, especially programming work including logic, and/or modifying the materials to fabricate and reproduce other versions is very seriously treated based on the NJIT University Policy on Academic Integrity

VII. Consent

Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.